

Suppose that you are designing a scissor table as shown in Figure 2. You want to find the minimum size of the hydraulic jack that statically supports the table and also the loadings on element 1. By using the free body diagrams as shown, perform the following steps.

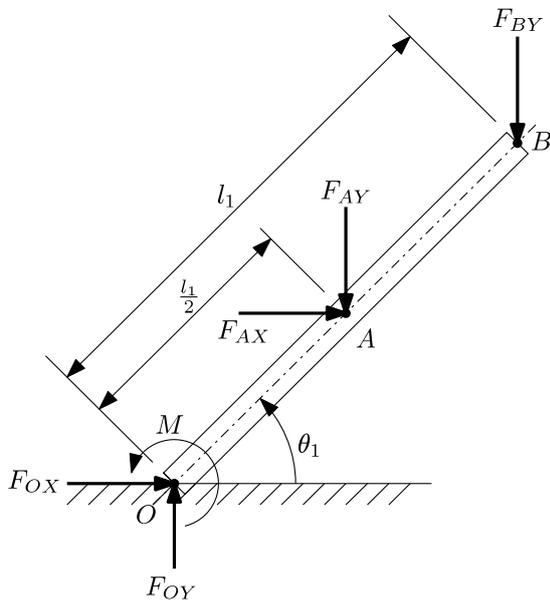
- Derive the component of forces F_{OX} , F_{OY} , F_{AX} , F_{AY} , F_{BY} that act perpendicularly to element 1.
- Derive the expression for moment M that equilibrates element 1.
- Given the parameters in Table 1, find the force F_2 that equilibrates element 2.
- Using the given parameters, plot the bending moment acting perpendicular to element 1.

Table 1: Parameters for scissor table

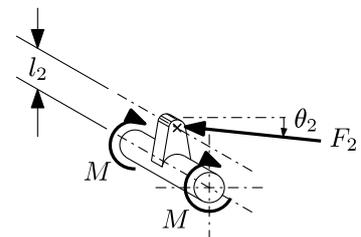
Parameters	Values	Units
F_{OX}	0	N
F_{OY}	3750	N
F_{AX}	0	N
F_{AY}	2500	N
F_{BY}	1250	N
l_1	0.76	m
l_2	0.06	m
θ_1	45°	
θ_2	17°	



(a) A scissor lift table with 250 kg SWL (Safe Working Load) is loaded with a prototype electromechanical brake.



(b) Loading on element 1. The element 2 is exerting a moment, M at point O .



(c) Loading on element 2. The force, F_2 produced by the hydraulic jack 3 is balanced by 2 reaction moments, M .